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CONTEXTUAL TEACHING AND LEARNING APPROACH (CTL) IN MATHEMATICS TO DEVELOP ADVERSITY QUOTIENT (AQ)

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Abstract

CTL approach is a learning process that involves students in important activities that help students associate academic learning with real-life context. There are seven components in the CTL approach, namely: 1) contructivism, 2) inquiri, 3) questioning, 4) learning community, 5) modelling, 6) reflection, and 7) authentic assessment. It is important to know that generally students have difficulties in learning mathematics, the difference is only in levels of difficulty. In this case, potential AQ is truly needed in learning mathematics. AQ is an individual's ability to survive in the face of all sorts of trouble to find a way out, to solve various problems, reduce barriers and obstacles by changing the way of thinking and attitude towards the difficulties faced. There are four dimensions of AQ: control, ownership, range, and endurance. Based on the level of AQ, there are three types of student groups, namely: quitter, campersdan climbers. This paper studied the theory of mathematics learning, contextual teaching and learning approach (CTL), and adversity quotient (AQ).

Keywords: Learning math, contextual teaching and learning approach (CTL), and adversity quotient (AQ).

BACKGROUND

Starting from elementary school, middle level school, until collage students already learn mathematics. Specifically, in the elementary school and middle level school, students learn mathematics by Soedjadi (2000) called school mathematics. Matemathics schools is part of mathematics which choosen by or orientated to education interest and science/technology development. That is show if school mathematics not necesary same with matehematics as knowledge. It is like that, because there are different in matter: presentation, model of how idea, limitedness of entire, and level of it's abstraction. Mathematics has specific characteristics if compare with other dicipline of knowledge. Mathematics related with abstract idea which hierarchy simbol and deductive reasoning. Learn of mathematics is high level mental activity and demand understanding and dilligent practice.

Recently, most of students still have negative impression of mathematics, such as: mathematics as "ghost", "scary", dificult and bored, mathematics is not fun, mathematics is monotonous saint, always about theory and only fulfill with formula, lookls like "far away" and not related with students dialy activities. If students have negative impression with mathematics, even hate it because of dificulties, thats mean they did not like challenges. Perhaps,that think causes by the abstarct objects or the way how the teacher teach it, uninteresting for the students.

Every students can not avoid every dificulties of learn mathematics. In generaly , students get dificulties in learning mathematics, only the level of dificulties are different. There is student feel that dificult just in specific matter, another students feel difficult only in specific part of mathematics and there are students feel dificult in all of part of mathematics. Thus it is surely every students who are learn about mathematics ever feel dificult.

To face the dificulties, needed student's power of will, so students can get maximal result, so they can change the difficulties to be challenges and oportunity. This intergrity and

power of will called by Stoltz (2007) as *Adversity Quotient* (AQ). Potention of AQ very needed in learning mathematics. Basically, study is problem solving ability. Stoltz (2007) said that every succes people in learning, is people who have high AQ. AQ very influences for study result. Difficulties for them exactly maked ungiven. They can change dificulties to be oportunities. They are optimistic people which looked up dificulties as temporary and can be handle.

One of challenge in school mathematics us abstract idea and meaningless mathematics learning for students. One of learning approach which involve students actively and meaningful to connected academics context with dialy activities is *contextual teaching and learning* (CTL). More and more students can relating lesson material with contextual activities, so they can get more meaning from that lessons. Hopefuly, that way can increase student's positive impression to appreciate of mathematics and finally students ability and mathematic achievement can be improve. if positive attitude improve so student's AQ can be improve too.

In this paper, explain about what is AQ, what are AQ's dimension, and how to AQ's integrated to mathematics learning with CTL.

EXPLANATION

Contextual Teaching and Learning

CTL approach is integration knowladge to reality life application. Related with that, hopely in every learning activities, teacher can start with presentate problem or event in real world. Johnson (2002: 3) said that CTL engages students is significant activities that help them to connect academics studies to their context in real-life situations. By making these connections, students see meaning in schoolwork. CTL is learning process which start with take (simulation, telling, dialogue, or discussion) real world events on student's daily live and then input to concept for discuss (Suherman, 2003: 3). Muslich (2007: 41) said that CTL is learning concept that help teacher connected between learning material with student's real world situation, and to push student to make connection between their knowledge with their real worl application. Beside that Keneth in Rusman (2011: 189-190), explain that CTL is contextual teaching is teaching that enables learning in which student employ their academic understanding and abilities in a variety of in-out of school context to solve simulated or real world problems, both alone and with others. More and more students can relating lesson material with contextual activities, so they can get more meaning from that lessons.

CTL is a global system which are related, so make student to make relationship and give meaning. STL as learning approach have 7 components (Trianto: 2007):

1. Contructivism

   Is a building process or arrange new knowledge in student cognitive structure based on their experience. In contructivism opinion, there are many thing (Dipi, 2007: 279) , that are:

   a. Learning is preparing of condition to make student to build their own knowledge.
   b. Learning activities packing to be process knowledge construction, not only taking knowledge, so learning start from what are student know.
   c. Learning is active process to build knowldge from natural experience abstract or human being, which doing by personal and social to find the meaning with taking information so it make sense appropriate with student's idea.

   So, teacher's tasks are fasilitating that process with make meaningful knowledge and relevance to students, give oppurtunity for studets to find and apply their own ideas, and to push students for apply their own strategies in learning.

2. Inquiri

   Is a learning process base on searching and discovery through systematicly thinking process. The steps of inquiri there are (Trianto, 2007: 110): a) formulating problem; b) obeservation; c) analysis; d) communicate and presentation

3. Questioning
   Is a learning process with questions that can lead and manage students to find every lesson materials. Because of that, teacher's abilities in developing question ability so important.
4. Learning community
   CTL doing by group learning. Student devide by groups with heterogen members, from their abilities, speed of learning, even looking from their talents.
5. Modelling
   Is learning with act something as example that can be follow for every students. In CTL, teachers not the only one as the model, modelling can be planning by students. Someone can be pointied to modelling base on their own experiences.
6. Reflection
   In last learning process give student's opportunity to remind what they are learned. Let student interpretation their own experience independently, so they can summarize about their own experience.
7. Authentic assessment
   Assessment is needed to know that students heve positif respon to developing student's intelektual or their mental. This assessment is done constantly during learning process.

Base on that components, generally s CTL step are:

1. Foreword activity
   a. Teacher explains the competence that must achieve, usefull from learning process, and the important of lesson material will study by student with propose problem in rel world
   b. Teacher explain CTL process
      1) Student devide in some group with heterogen members (ability, gender, talent, interest, and motivation)
      2) Every group get task to observation
      3) Pass with observation students get task to note something which related with lesson
      4) Teacher discuss about task that must do by student
2. Main activity
   a. In outdoor
      1) Student observate accordance with task in each group
      2) Student note something that they find accordance with observation tools that they are found before.
   b. In class
      1) Student discuss their find result accordance with task in each group
      2) Student report their result of discussion
      3) Every group answer the question from the other group
3. Closing activity
   With helping from teacher, student can reflect and conlclude result of observation accordance with indicator output of lesson that must achieve.

According Jhonson (2002: 26-35), in the CTL there are three scientific principles. To understand these principles and the ways in which CTL manifests them is to understand why contextual teaching and learning provides a pathway to academic excellence all students can follow. The explanation of these three principles, there are:

1. The principle of interdependence
   Interdependence is manifest, for instance, when students collaborate to solve problems and when the teachers confer with collagues. It is apparent when different subjects are linked, and when partnerships join schools with businesss and the community. The student to make the meaningfull relation. Because the principle of interdependence does permate everything, it makes it possible for student to make connections that reveal meaning. The principle of interdependence also supports collaborative work. Collaborating helps students identify issues, design plans, and explore solution. Collaborating will help students discover that

listening to one another lead to success. Everyone's distinctive perspectives and unique ability weave a whole greater than the sum of its parts.

2. The principle of differentiation
   Differentiation is evident when CTL challenges students to respect one another's uniqueness, to respect difference, to be creative, to collaborate, to generate new and different ideas and results, and to realize that diversity is a sign of robustness and strength. Create of student's independence that can contruct attitude of student to learn independently in context real-life, for achieve a goal which meaningfull.
3. The principle of self-organization
   Self organization is apprent when students explore and discover their own distinctive abilities and interest, benefit from the feedback authentics assessment provides, review their own efforts in the light of clear objectivities and specific standards, and participate in student-centered activities. The principle of self-organization requires educators to encourage each student to actualize that student's full potential. In keeping with this principle, the central aim of the CTL sytem is to help student achieve academic excellence, manage skills, and development of attitude and morality. When students connect academic material with the context of their own personal circumstances, they are engaged in activities that emody the principle of self organization. They assume responsibility for their own decisions and conduct, appraise alternative, make choices, develop plans, analyze information, create solutions, and critically evaluate evidence.

Hopely, CTL help the students discover meaning in their studies by connecting academic material with the context of their daily lives. They make significant connections that meaning by practicing self regulated learning, collaborating, thinking critically and creatively, respecting others, reaching high standards, and participating in authentic assessment task.

Adversity Quotient (AQ)

According language, the word "adversity" come from english, it's meaning is failure or bad luck. Devakumar (2009) said that AQ is knowledge of resistance human. According Conista & Macasaet (2013: 14), adversity is the one of study in psychology with definition as the ability to manage difficult which to face in daily. Stoltz (2007: 9) adversity quotient AQ is an individual's ability to survive in the face of all sorts of trouble. Based on that explanation, can conclude that adversity quotient is an individual's ability to survive in the face of all sorts of trouble to find a way out, solve the problems, reducte of obstruction and challenges with change the way of thinking and attitude for that difficult.

Stoltz (2007: 140-166) given four basic dimension which will produce high adversity quotient skill, namely:

Control (C), relate with how much the individual can control difficults which they face and how far they feel that it is important in event which make trouble. More and more students have high control, so more and more make it posible for student hold in trouble and dilligent in mathematics problem solving. And on the contrary, if less snd less the level of control, so individu be surrender.

Origin and ownership (O_2), will ask who and what is the source of problems, and how far student consider that they are the source of problem. Student with low origin will tendent that all of trouble or difficult is come from their fault, indecency, or their stupidity, and make feeling and thinking damage their spirit.

Reach (R), is a part of adversity quotient which ask how far difficult will reach other part from student. Reach also as how far difficult can reach the other part from the other individu. More and more the student's reach, so more and more the posibility for the student to respect the difficult as spesific and limitation. More efective on arrest or limit difficult, so individi will more powerful and the feel of desperate or can not different of relevan things with difficult, so when we have a prouble in one of field, student must not feel that they have difficult in all of their life.

Endurance, this dimension more relate with induvidual's perseption what it will permanent or temporary. Endurance can make the assessment about good or bad situation. The individu who have high endurance will have high hopely and optimism in solve the problem. More and more individu have high endurance, so more and more posibility for individu to face a succsess as a something is temporary and if individu have low AQ, so they assume that difficulty is a something which difficult problem.

Based on the level of AQ, there are three types of student groups (Stoltz, 200: 18-20), namely:

Quitters, is a individu who choose to out from the difficulty, avoid from duty, and stop if there is difficulty. Quitters, usually stop in half solution, they can be desperate and surrender. Student in this type is quick to satisfied with their basic needs and tend to be passive, and then back away and stopped. Individu like this can lose the big opportunity in their live.

Campers, or satis-ficer (from the word "satisfied" and "suffice"). This group is satisfied with self sufficient and don't want to develop themselves. This group is also not high capacity for change as driven by fear and just looking for safety and comfort. *Campers* at least have stepped up and responded to the challenge, but once it reaches a certain stage, *campers* stopped even though there was a chance to grow even more.

Clambers (climber) they are always optimistic, seeing opportunities, see the gap, see hope beyond despair, always excited to go forward. *Climbers* are not influenced by the environment, but with different types of creativity is trying to control his environment. *Climbers* will always think of alternatives and issues considers the difficulties and obstacles that exist in fact be an opportunity for more advanced.

Integration of AQ in Learning Mathematics

Integrating AQ in mathematics learning is paying attention or involve AQ's students in learning mathematics. Teachers noticed AQ's students at each phase of learning. Every mathematical learning model has three phases, namely: forward, main, and closing activity. May be, there are learning approach use the another term, but the principle remains o the three phases. Here will be described how to integrate AQ in each phase of CTL: In forward activity of CTL, AQ is delivered as part of apperception. The teacher explaind briefly that each student is actually in there called intelligence overcome potential difficulties. The teacher's explanation that the student is expected to realize the potential of overcoming difficulties possessed intelligence can be utilized as much as possible to learn mathematics. In this phase is expected that no student who surrendered before studying mathematics. As we know that there are three types of students by level of AQ namely *climber, camper,* and a *quitter.* In the main activity, the teacher need to pay attention to develop AQ's student. Teachers should not only pay attention to a some group students. Teachers should pay attention to students who have a high AQ without ignoring the students who have low AQ. So that all students feel cared for. Students *climber* may be given additional tasks enrichment, while teachers guide students *camper* and *quitter*. In this situation the teacher is not an easy job. However, teachers can actually utilize the potential of students *climber* become peer tutors to other friends. Students *climber* can also serve as chairman and spokesman for each group in a discussion group or class disksusi. Exploiting the potential of students learning mathematics *climber* in any particular purpose depends on the creativity of teachers. In the closing activity. teachers also need to pay attention to AQ students. Students *climber* can be directed teachers to help their friends in concludes the discussion, summarize the subject matter. Homework assignment should be done in groups. The three types of students should be distributed evenly on each group.

Measuring AQ

AQ can be measured by giving questionnaires to students. AQ contains statements that represent the dimensions of AQ. Basically, the general statements on the questionnaire contains statements positive and negative, and student responses were analyzed. But the questionnaire

were analyzed AQ is a negative statement, because the negative statement illustrates how students face a given problem.

Stoltz (2007) states AQ is a concept of human capacity in the form of their response patterns when facing difficulties in various aspects of life. To measure this response, Stoltz makes *Adversity Respone Profile* (ARP). In the ARP operationalized form a total score of the subject that is the result of the sum score of the dimensions that make up the construct AQ, namely *control, ownership, reach, and endurance.*

CONCLUSION

CTL approach recommended to be implemented in the learning of mathematics, because theoretically believed to be able to develop AQ. The steps are performed in an integrated CTL provide opportunities for the development of AQ. Build a student perspective that difficulty is part of the growth toward independence through persistence and perseverance. The difficulty is not removed from the front of the students, but the courage should be developed in the child to face difficulties in learning at school.

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